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IMPROVEMENTS IN THE STANDARD INSECT SWEEP NET

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The standard sweep net, with a circular opening about 15 inches in diameter, has been used for collecting leafhoppers on the beet leafhopper project ever since the work was started. Various workers have recognized the drawbacks of net collection as an indicator of leafhopper populations, and other quantitative methods have been devised and used extensively, but the sweep net still remains the most rapid method available, and efforts have been made to increase its efficiency and reliability. Two improvements in the sweep net which have been made at this laboratory during the past two years are described below.

I. Modification of the Net Frame for Sweeping Low Vegetation

The standard insect net has a round opening, and when vegetation a few inches in height is swept, only a small part of the circumference of the net opening comes in contact with the vegetation. During the winter of 1938-39 the senior writer experimented with various modifications of this round opening, finally producing a net frame that was nearly semicircular. It was found that this type of opening regularly secured larger numbers of leafhoppers than the ordinary circular net, and that the collections tended to be more uniform, because of the greater disturbance of the vegetation.

The semicircular frame is constructed by bending the two members of the frame at right angles approximately 7½ inches from the tips. The bending is facilitated by heating the frame with a blowtorch at the point where the bend is to be made. The temper of the steel is altered at this point, but this seems to make little difference in the strength of the frame, as such frames have been in constant use for over a year without giving evidence of weakness.

Figure 1 shows the modified net frame and a standard round frame without nets. The greater efficiency of the modified net frame for use on low-growing vegetation can be easily seen from the photograph.

II. An Improved Net Bag

The cloth bag originally used for sweeping work was made of heavy cotton or light canvas material. Experiments with lighter materials, performed by the senior writer and F. R. Lawson during 1930 and 1931, showed that some of these lighter materials could be used to good advantage, and in recent years most of the nets used have been made from cotton scrim or marquisette, which allows the air to flow through the net. Air flow is of considerable importance, as comparative tests have shown that a porous net will capture at least twice as many leafhoppers as one made of material so tightly woven that it seriously obstructs air flow. The chief disadvantage of the more open materials is their tendency to catch upon twigs and thorns, which tear the net or open up the threads of the weave so that leafhoppers escape. This makes it necessary to replace the net bags frequently, as one bag will seldom last for more than two or three days of active service. The junior writer suggested that net bags be constructed of two materials, the outer or lower half of heavy cotton sheeting, and the upper or inner half of marquisette. The half made of heavy cotton sheeting would come in contact with the rough vegetation and the ground, while the half made of marquisette would permit the free passage of air. Such nets have been used for over a week of heavy duty without showing any signs of wear, and they capture as many leafhoppers as nets constructed entirely of open-weave material.

In constructing these nets the two materials are sewed together with a flat or "felled" seam, so that the net is reversible. Figure 2 shows one of the net bags, and figure 3 shows the bag in position on one of the modified net frames.

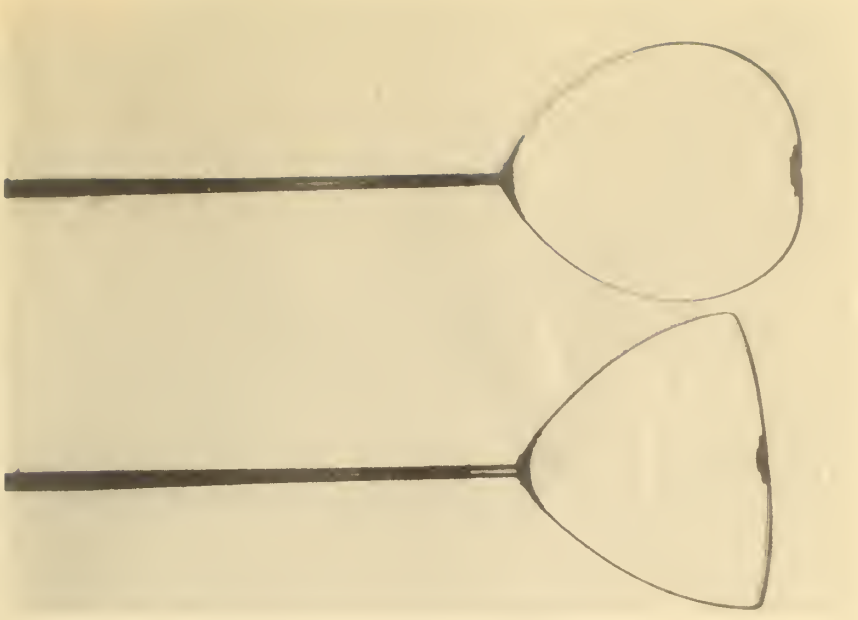

Figure 1.--The standard round sweep net frame and the new semicircular frame.

Figure 2.--The new net bag, made half of cotton sheeting and half of marquisette.

Figure 3.--The new net bag, in position on a semicircular frame.